Fig. 1

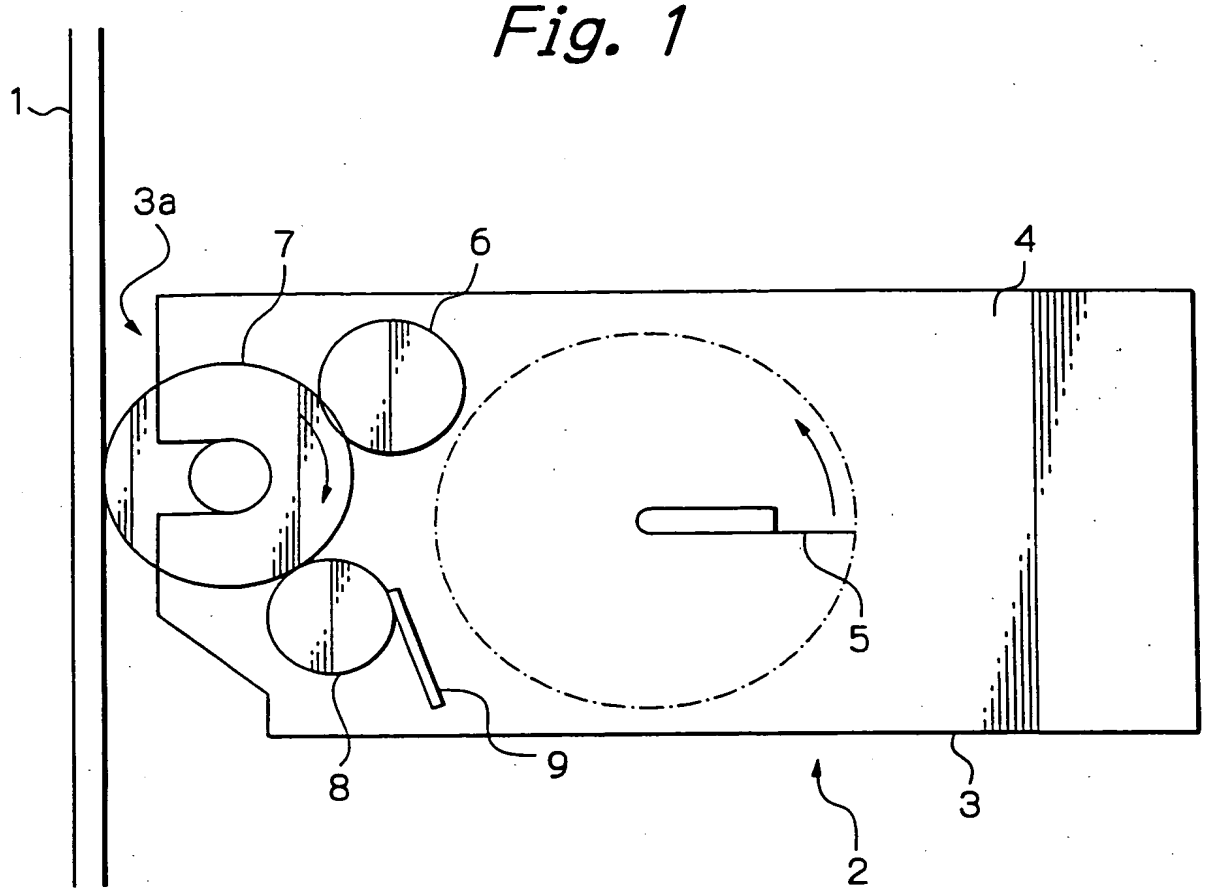
1
3a
7
6
4
5
8
9
3
2

Fig. 2

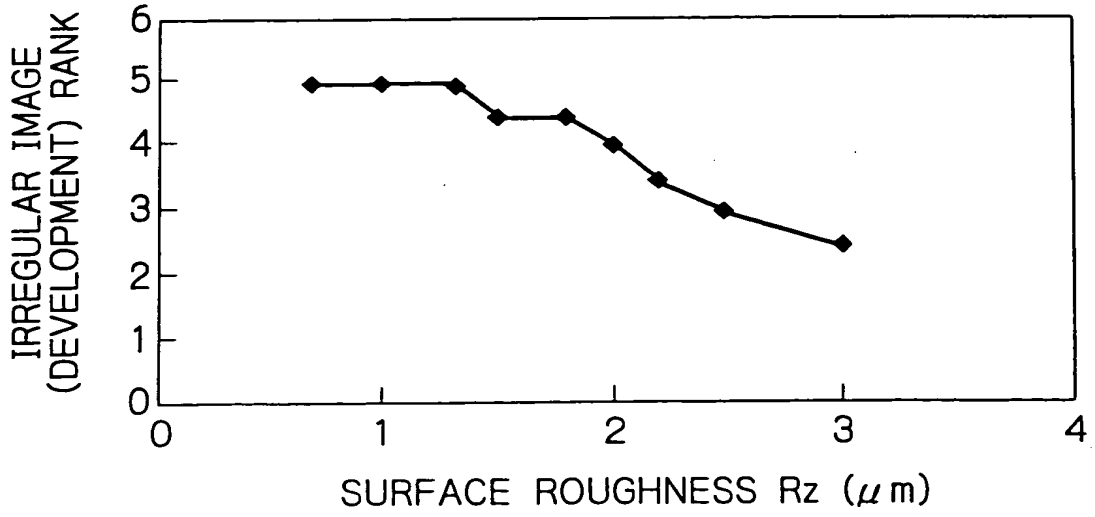
IRREGULAR IMAGE (DEVELOPMENT) RANK
0
1
2
3
4
5
6
SURFACE ROUGHNESS Rz (μm)

Fig. 3

SAMPLE NO.	DEVELOPING ROLLER				DOCTOR ROLLER				
	ASCAR C HARDNESS (Deg.)	CORE	COVERING MATERIAL		ASCAR C HARDNESS (Deg.)	CORE	COVERING MATERIAL	(0.3≦Rz<2.0)	
		MATERIAL	MATERIAL	COVERING METHOD		MATERIAL	MATERIAL	COVERING METHOD	THICKNESS (μm)
(1)	52	URETHANE RUBBER	FLUORO-CARBON RESIN	COATING	56	URETHANE RUBBER	NYLON	TUBE	50
(2)	52	URETHANE RUBBER	URETHANE RESIN	COATING	56	URETHANE RUBBER	ETFE	TUBE	50
(3)	52	URETHANE RUBBER	SILICON RUBBER	COATING	56	URETHANE RUBBER	PI	TUBE	50
(4)	70	URETHANE RUBBER	NYLON	TUBE	56	URETHANE RUBBER	ETFE	TUBE	50
(5)	52	URETHANE RUBBER	URETHANE RESIN	COATING	56	URETHANE RUBBER	ETFE	TUBE	50
(6)	ABOUT 100	ALUMINUM	FLUORO-CARBON RESIN	COATING	56	URETHANE RUBBER	NYLON	TUBE	50
(7)	ABOUT 100	ALUMINUM	PHENOL RESIN	COATING	56	URETHANE RUBBER	NYLON	TUBE	50
(8)	ABOUT 100	ALUMINUM	PA RESIN	COATING	56	URETHANE RUBBER	NYLON	TUBE	50
(9)	ABOUT 100	ALUMINUM	URETHANE RESIN	COATING	56	URETHANE RUBBER	NYLON	TUBE	50

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FIG.4
FIG.4A
FIG.4B

Fig. 4A

SAMPLE NO.	DEVELOPING ROLLER		DOCTOR ROLLER					
			ASCAR C HARDNESS (Deg.)	CORE	COVERING MATERIAL			
	MATERIAL	VICKERS HARDNESS (HV)		MATERIAL	SURFACE ROUGHNESS R [μm]	MATERIAL	COVERING METHOD	THICKNESS (μm)
(10)	ALUMINUM	80	52	POLY-URETHANE RUBBER	$0.3 \leqq Rz < 2.0$	NYLON	TUBE	50
(11)	ALUMINUM	80	60	EPDM	$0.3 \leqq Rz < 2.0$	NYLON	TUBE	50
(12)	ALUMINUM	80	45	SILICON RUBBER	$0.3 \leqq Rz < 2.0$	NYLON	TUBE	50
(13)	ALUMINUM	80	55	NBR	$0.3 \leqq Rz < 2.0$	NYLON	TUBE	50
(14)	ALUMINUM	80	60	EPICHLORO-HYDRIN RUBBER	$0.3 \leqq Rz < 2.0$	NYLON	TUBE	50
(15)	ALUMINUM	80	40	BR	$0.3 \leqq Rz < 2.0$	NYLON	TUBE	50
(16)	ALUMINUM	80	52	URETHANE RUBBER	$0.3 \leqq R_z < 2.0$	NYLON	COATING	
(17)	ALUMINUM	80	52	URETHANE RUBBER	$0.3 \leqq Rz < 2.0$	FLUORO-CARBON RESIN	COATING	
(18)	ALUMINUM	80	52	URETHANE RUBBER	$0.3 \leqq Rz < 2.0$	SILICONE RESIN	COATING	
(19)	ALUMINUM	80	52	URETHANE RUBBER	$0.3 \leqq Rz < 2.0$	URETHANE RESIN	CONTING	

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Fig. 4B

SAMPLE NO.	DEVELOPING ROLLER		DOCTOR ROLLER					
			ASCAR C HARDNESS (Deg.)	CORE	COVERING MATERIAL			
	MATERIAL	VICKERS HARDNESS (HV)		MATERIAL	SURFACE ROUGHNESS R [μm]	MATERIAL	COVERING METHOD	THICKNESS (μm)
(20)	ALUMINUM	80	52	URETHANE RUBBER	0.3≦Rz<2.0	ETFE	TUBE	50
(21)	ALUMINUM	80	52	URETHANE RUBBER	0.3≦Rz<2.0	PVDF	TUBE	50
(22)	ALUMINUM	80	52	URETHANE RUBBER	0.3≦Rz<2.0	PET	TUBE	50
(23)	ALUMINUM	80	52	URETHANE RUBBER	0.3≦Rz<2.0	ACRYL-URETHANE RESIN	COATING	
(24)	SUS	270	52	URETHANE RUBBER	0.3≦Rz<2.0	NYLON	TUBE	50
(25)	ALUMITE-PROCESSED ALUMINUM	290	52	URETHANE RUBBER	0.3≦Rz<2.0	NYLON	TUBE	50
(26)	Ni-PLATED ALUMINUM	400	52	URETHANE RUBBER	0.3≦Rz<2.0	NYLON	TUBE	50
(27)	Cr-PLATED ALUMINUM	450	52	URETHANE RUBBER	0.3≦Rz<2.0	NYLON	TUBE	50
(28)	LOW-TEMP NITROGENATED ALUMINUM	500~1000	52	URETHANE RUBBER	0.3≦Rz<2.0	NYLON	TUBE	50

Fig. 5

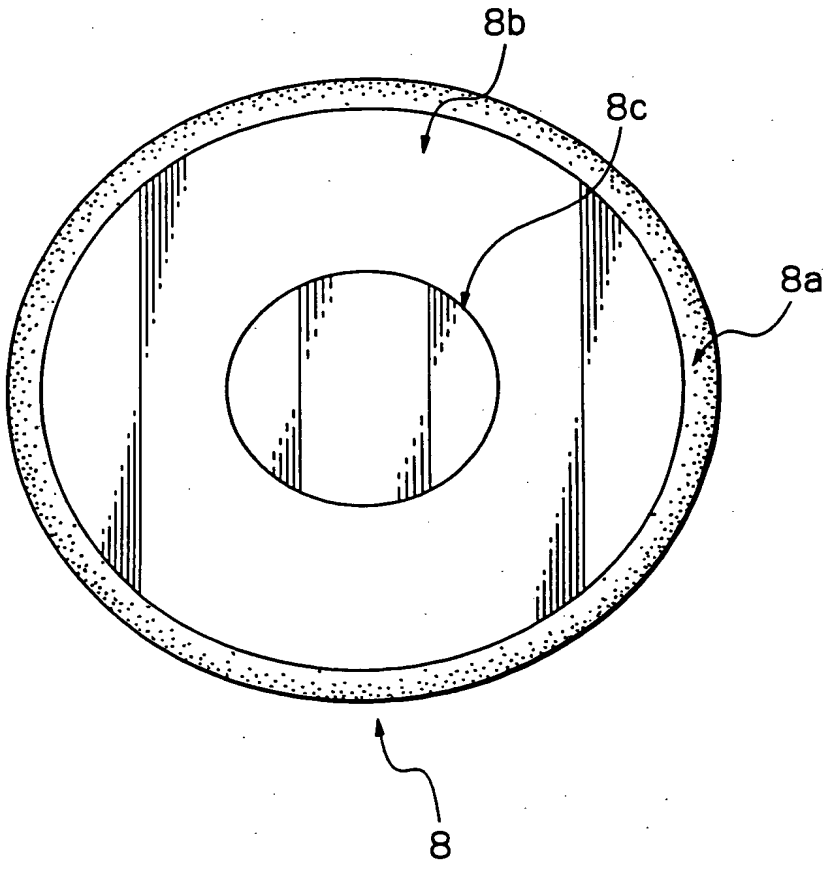


Fig. 6

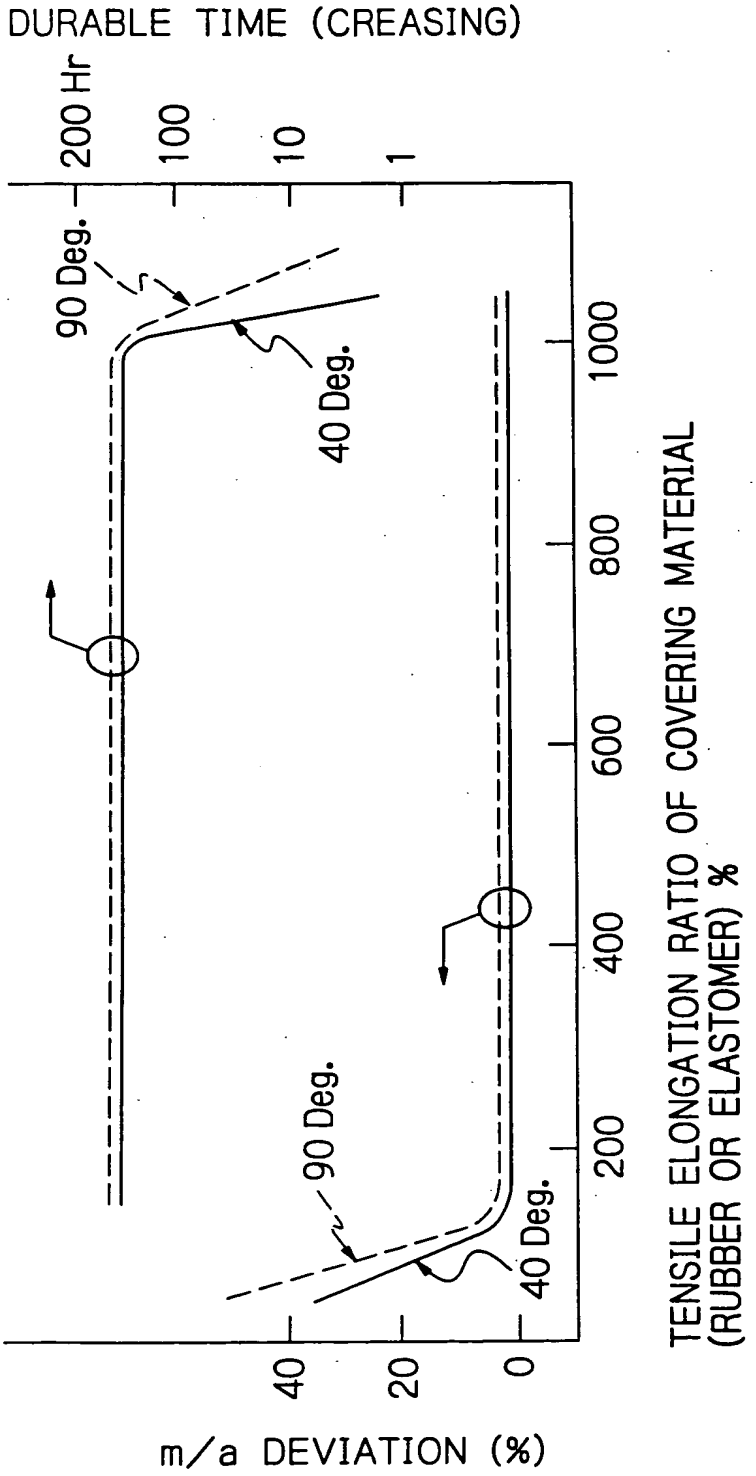

DURABLE TIME (CREASING)
200 Hr
100
10
1
90 Deg.
40 Deg.
90 Deg.
40 Deg.
1000
800
600
400
200
40
20
0
m/a DEVIATION (%)
TENSILE ELONGATION RATIO OF COVERING MATERIAL
(RUBBER OR ELASTOMER) %

Fig. 7

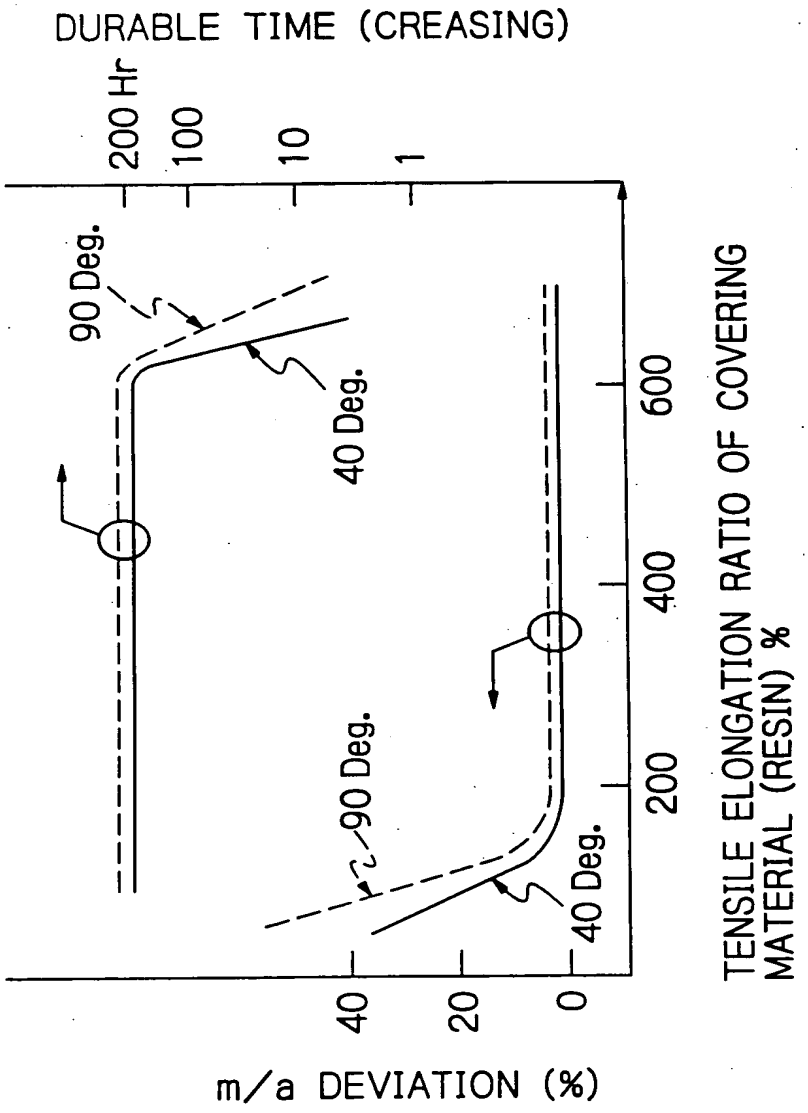
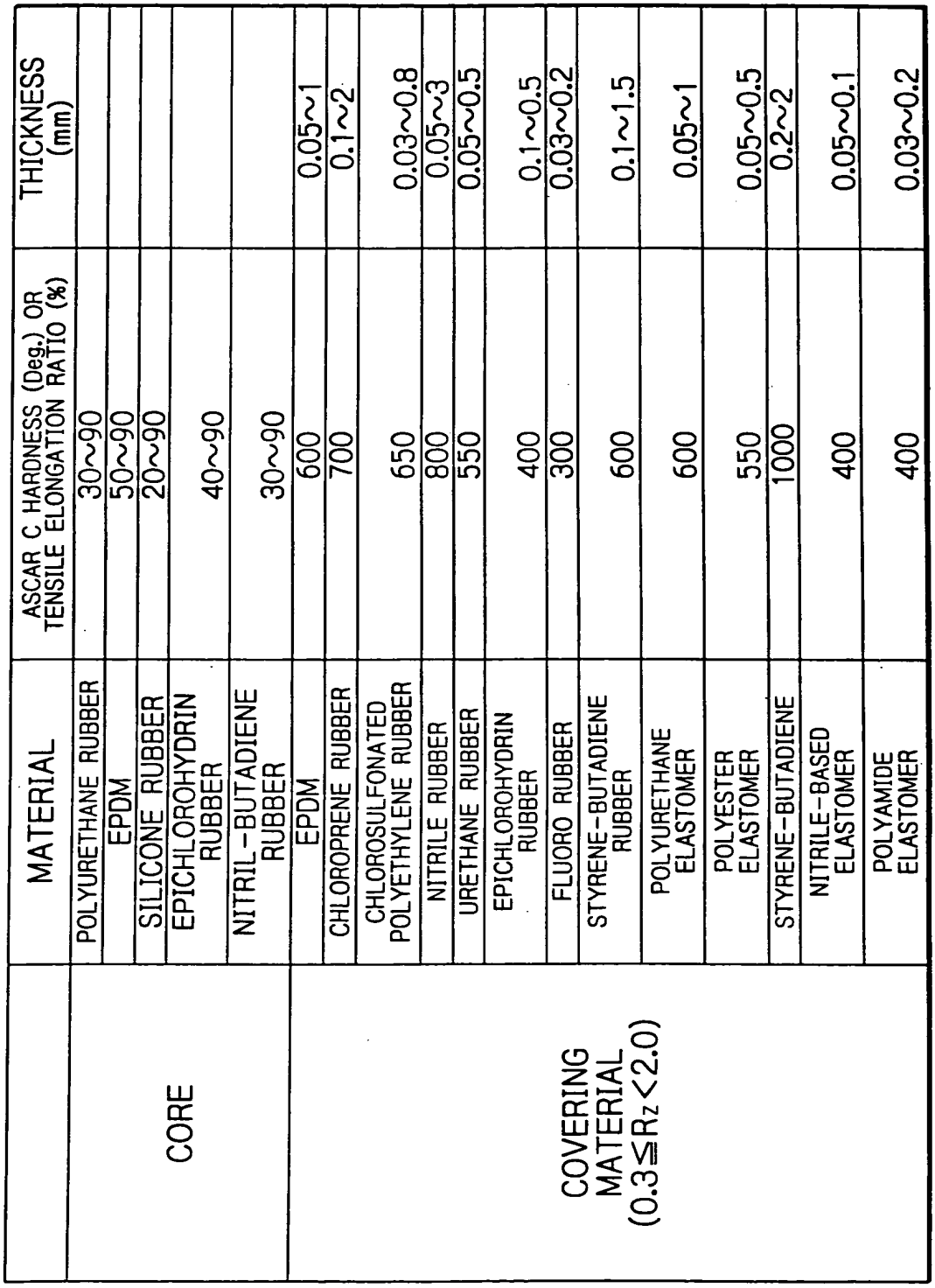

DURABLE TIME (CREASING)
200 Hr
100
10
1
90 Deg.
40 Deg.
90 Deg.
40 Deg.
600
400
200
40
20
0
m/a DEVIATION (%)
TENSILE ELONGATION RATIO OF COVERING MATERIAL (RESIN) %

Fig. 8



	MATERIAL	ASCAR C HARDNESS (Deg.) OR TENSILE ELONGATION RATIO (%)	THICKNESS (mm)
CORE	POLYURETHANE RUBBER	30~90	
	EPDM	50~90	
	SILICONE RUBBER	20~90	
	EPICHLOROHYDRIN RUBBER	40~90	
	NITRIL-BUTADIENE RUBBER	30~90	
COVERING MATERIAL ($0.3 \leqq Rz < 2.0$)	EPDM	600	0.05~1
	CHLOROPRENE RUBBER	700	0.1~2
	CHLOROSULFONATED POLYETHYLENE RUBBER	650	0.03~0.8
	NITRILE RUBBER	800	0.05~3
	URETHANE RUBBER	550	0.05~0.5
	EPICHLOROHYDRIN RUBBER	400	0.1~0.5
	FLUORO RUBBER	300	0.03~0.2
	STYRENE-BUTADIENE RUBBER	600	0.1~1.5
	POLYURETHANE ELASTOMER	600	0.05~1
	POLYESTER ELASTOMER	550	0.05~0.5
	STYRENE-BUTADIENE	1000	0.2~2
	NITRILE-BASED ELASTOMER	400	0.05~0.1
	POLYAMIDE ELASTOMER	400	0.03~0.2

Fig. 9

	MATERIAL	ASCAR C HARDNESS (Deg.) OR TENSILE ELONGATION RATIO (%)	THICKNESS (μm)
CORE	POLYURETHANE RUBBER	30~91	
	EPDM	50~90	
	SILICONE RUBBER	20~90	
	EPICHLOROHYDRIN RUBBER	40~90	
	NBR	30~90	
COVERING MATERIAL ($0.3 \leqq R_z < 2.0$)	NYLON 6	400	30~121
	NYLON 66	200	50~100
	NYLON 11	350	40~80
	NYLON 12	300	20~150
	POLYETHYLENE	450	20~150
	POLYPROPYLENE	500	35~150
	POLYVINILIDENE FLUORIDE	250	50~100
	POLYESTER	300	30~80

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